

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750) Migration of Contaminated Groundwater Under Control

Facility Name: Former United Shoe Machinery Facility
Facility Address: 181 Elliott Street, Beverly, MA
Facility EPA ID #: MAD043415991

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

- If yes - check here and continue with #2 below.
 If no - re-evaluate existing data, or
 if data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

- If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.
- If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

In accordance with the EPA-approved Written Proposal/Sampling and Analysis Plan Revision 2 (“SAP”) for the Site dated September 29, 2017 and the Elliott Landing SAP Revision 4 dated September 29, 2017 (“Elliott Landing SAP”), extensive groundwater sampling and analysis was performed at the Site. Please see attached **Figure 1** for the site locus and **Figure 2** for the site plan.

Groundwater wells included those related to potential vapor intrusion (sampled in January 2018 and April 2018) and those not related to potential vapor intrusion (sampled in December 2017, April 2018, June 2018, and September 2018). Wells not related to vapor intrusion (as identified in the SAPs) included wells FSL-1, FSL-2, FSL-3, FSL-4, FSL-5, FSL-6, FSL-7, FSL-11, FSL-12, FSL-13, FSL-14, and FSL-15. Analysis parameters as defined in the SAPs varied per well, but included extractable petroleum hydrocarbons / polycyclic aromatic hydrocarbons (EPH/PAH), volatile petroleum hydrocarbons (VPH), volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs). Wells related to potential vapor intrusion (as identified in the SAPs) included wells FSL-2, FSL-8, FSL-9, FSL-10, FSL-11, FSL-12, FSL-100, FSL-200, and FSL-300. Analysis parameters as defined in the SAPs varied per well, but included VPH, EPH/PAH, and VOCs. Wells FSL-2 and FSL-3 could not be sampled at any of the four sampling events, as they ran dry during purging and did not recharge for sample collection. Please see **Figure 2** for the site plan showing the locations of the groundwater monitoring wells.

The results of the groundwater laboratory analysis for wells not related to vapor intrusion are shown in the attached **Table 1**. The results of the groundwater laboratory analysis for wells related to potential vapor intrusion are shown in the attached **Table 2**. The full laboratory analytical reports are included in the Administrative Consent Order Progress

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

Reports for December 2017, January 2018, April 2018, June 2018, and September 2018. For the wells listed in **Table 1**, the results were consistent in all four sampling events. For VPH and VOCs, ethylbenzene, m,p-xylene, C₉-C₁₂ aliphatic hydrocarbons, and cis-1,2-dichloroethene were detected in well FSL-7 at concentrations above the Massachusetts Contingency Plan (MCP) Method 1 GW-2 and/or GW-3 standards; these were the same compounds detected in the soil sample collected during the installation of FSL-7. The remaining wells analyzed for VOCs and/or VPH had no such compounds detected except for trace concentrations in FSL-11 and FSL-12. Trace PCBs were detected in five of the seven wells where PCBs were analyzed, but the maximum total PCB concentration detected (0.26 ug/L) was more than an order of magnitude below the most conservative nondrinking water regulatory action level of 5 ug/L. Trace EPH/PAH were detected in eight of the nine wells where EPH/PAH were analyzed, but the maximum concentrations detected were well below the most conservative nondrinking water regulatory action levels.

For the wells listed in **Table 2**, the results were consistent in both sampling events. No VOCs were detected in April 2018, and trace concentrations of acetone were detected in wells FSL-11 and FSL-12 in January 2018. VPH and VPH indicator compounds were not detected in any sample. Trace PAHs (naphthalene, acenaphthene, and phenanthrene) were detected only in well FSL-8. In January 2018, trace EPH fractions were detected only in well FSL-300. All detected concentrations were well below the most conservative nondrinking water regulatory action levels.

Below is a discussion on the only compounds detected in groundwater at concentrations above applicable regulatory standards, guidelines, or guidance.

At FSL-7, a number of compounds were found (ethylbenzene, m,p-xylene, C₉-C₁₂ aliphatic hydrocarbons, and cis-1,2-dichloroethene) at concentrations above the MCP Method 1 GW-2 and/or GW-3 standards. Importantly, however, FSL-7 is located within the boundary of the former remediation area known as “Area 2.8”. This area was one of several site areas remediated in 1996 as part of MCP response actions and was a location from which petroleum and naphthalene-contaminated soil was excavated (*Phase IV As-Built Construction and Final Inspection Report*, Haley and Aldrich, Inc., October 1997). Elevated detections of naphthalene and 1,2-dichloroethene in ground water in this area date back more than 30 years.

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination)?

- If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”²).
- If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) – skip to #8 and enter “NO” status code, after providing an explanation.
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Groundwater contamination at the Site is limited to well FSL-7 (see response to Question 2). As this well is located in the former remediation Area 2.8, and the groundwater contaminants are consistent with the previously detected contaminants from the 1988-89 site assessment and 1996 remediation, it is apparent that the contaminants in well FSL-7 are related to the former source at Area 2.8. The former source has been inactive for more than 30 years and the overburden soil in this area was removed more than 20 years ago. There appears to be no migration of these contaminants in groundwater, as no other site well has had significant detections of the compounds found in well FSL-7. The nearest well to FSL-7 is well FSL-6, which is located approximately 50 feet downgradient of well FSL-7.

² “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

- X** If yes - continue after identifying potentially affected surface water bodies.
- If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Although potential receiving surface water bodies are Upper Shoe Pond and Lower Shoe Pond, no confirmation of groundwater migration to such water bodies exists. Were any such discharge into the surface water bodies to occur, which is not expected, it would be insignificant. See the response to Question 5.

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentrations of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

X If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

 If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

 If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

Contaminated groundwater is not expected to discharge into surface water bodies for two principal reasons. First, no evidence exists that contaminated groundwater is migrating to the nearest downgradient well (FSL-6), which is located approximately 50 feet downgradient of the lone impacted well (FSL-7) (see response to Question 3, above). Second, historical sampling of the surface water bodies on the property has not detected any contaminants of concern from monitoring well FSL-7. The property has two ponds (Lower Shoe Pond and Upper Shoe Pond) relatively nearby well FSL-7. The closest surface water body to well FSL-7 is Upper Shoe Pond, which is located approximately 50 feet to the southwest. Surface water and sediment samples have been historically collected from Upper Shoe Pond and Lower Shoe Pond from September 1987 to September 1988 and in June 2011; the contaminants of concern in well FSL-7 have not been detected in surface water or sediment samples in either Upper Shoe Pond or Lower Shoe Pond. Summaries of previous surface water and sediment data are included in Screening Level Ecological Risk Assessment, GEOPSPHERE Environmental Management, January 24, 2012.

Therefore, due to a lack of contaminants in surface water samples, if contaminated groundwater is discharging into the surface water, it is considered to be insignificant.

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

- _____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) Providing or referencing an interim-assessment⁵s appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors, which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.
- _____ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.
- _____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

No response necessary for this item per Question 5.

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”

X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations, which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”

_____ If no - enter “NO” status code in #8.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

Additional surface water and sediment sampling from Upper Shoe Pond and Lower Shoe Pond will be performed as part of the Site’s ecological assessment pursuant to the Administrative Consent Order. The detailed work scope has not been completed at this point, but the work scope will be reviewed and approved by EPA prior to initiation.

At this point, additional groundwater assessment is not deemed to be necessary since the previous 2017-2018 assessment was consistent in its results in that the only well with significant presence of contaminants was well FSL-7. The nearest wells to FSL-7 had no detections of any contaminants of concern from well FSL-7. The former source causing the contaminants in well FSL-7 is a historic source that has been inactive for more than 30 years and the overburden soil in that area was removed more than 20 years ago.

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Former United Shoe Machinery Facility, EPA ID # MAD043415991, located at 181 Elliott Street, Beverly, MA. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by



Date September 27, 2019

Bruce A. Hoskins, P.E., LSP
Environmental Consultant (FSL Associates, Inc.)
on behalf of property owner Beverly Commerce Park LLP

Supervisor (signature) Date _____
(print)
(title)
(EPA Region or State)

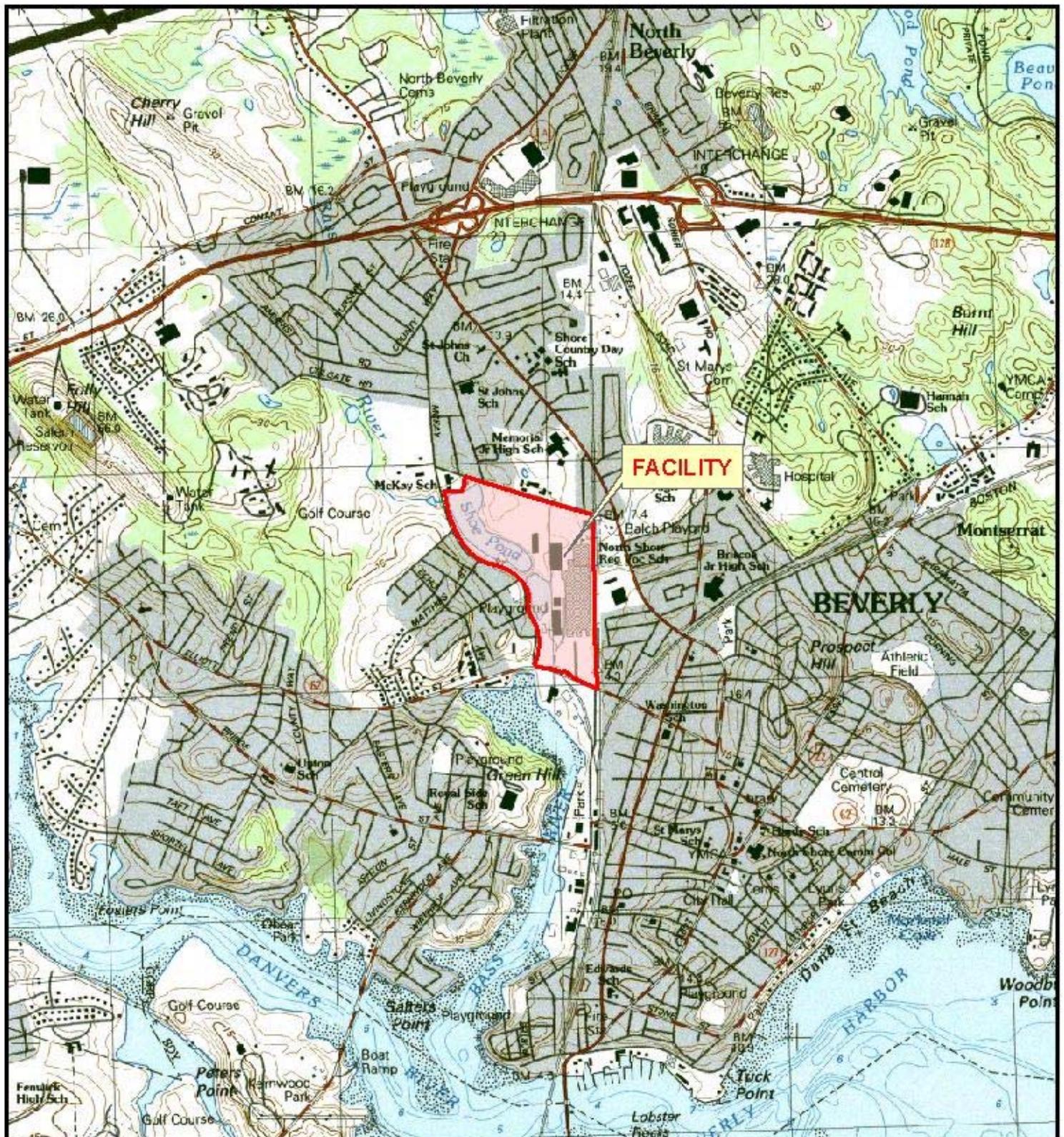
Locations where References may be found:

All referenced documents have been previously submitted to EPA.

Contact telephone and e-mail numbers:

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bhoskins@fslassociates.com (E-mail)

Craig Ziady, Cummings Properties LLC
(781) 932-7034
craig@cummings.com (E-mail)



SITE COORDINATES
 Longitude: -70.8871 W
 Latitude: 42.5596 N
 UTM 4,713,634m N
 345,086m E

Approximate Scale: 1 inch = 2,000 feet (1:24,000)
 0 1,000 2,000 4,000 6,000
 Feet

Figure 1 - Locus Plan

Project Number: 12201
 Client: Cummings

Created By: EAF Date: 03/15/12
 Checked By: BH Date: 03/15/12

Former United Shoe Machinery North Parcel
 181 Elliott Street
 Beverly, MA

Reference: MassGIS USGS Quadrangle: SALEM and MARBLEHEAD NORTH
 Image: M12201_Beverly/2012/Figures



FIGURE 2

SITE PLAN



FORMER UNITED SHOE
MACHINERY NORTH PARCEL
181 ELLIOTT STREET
BEVERLY MA

LEGEND

- STABILIZED SOIL DISPOSAL AREA
- TANKS
- ◆ FSL-X PROPOSED WELL
- ◆ HISTORIC PHASE II WELL

NORTH 



Environmental Engineering & Site Remediation
358 CHESTNUT HILL AVENUE
BOSTON MASS 02135
(617) 233-0001

NOTE:
Locations taken from Haley & Aldrich Plan
Dated October 30, 1997.

SCALE:	1'=125' +/-
DRAWN:	RT
CHK'D:	BAH
DATE:	3/29/17
DATE REV:	3/12/18

Table 2. Groundwater Analytical Results - Wells Associated with Potential Vapor Intrusion

Cummings Center

181 Elliott Street

Beverly, MA 01915

All results in ug/L

Values in **bold** exceed applicable MADEP Method 1 GW Standard OR Applicable Reportable Concentration

-- = Not Analyzed

NS = No Standard

NA = Not Applicable

NA = Not Applicable

1 = The Massachusetts Contingency Plan, 310 CMR 40.1600, Massachusetts UHM List April 25, 2014
3 = The Massachusetts Contingency Plan, 310 CMR 40.0974(2): Table 1, April 25, 2014

4 = The Massachusetts Contingency Plan, 310 CMR 40.0996(6): Table 6, Ap

⁴ = The Massachusetts Contingency Plan, 310 CMR 40.0998(8); Table 6, Ap-